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## ▶ HATCHERY

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### ➤ *Hatchery Management To Meet The Needs Of Wild Fish*

#### **Goal:**

*Protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries; non-consumptive fish benefits; and other related cultural and ecological values.*

#### **Objectives:**

- *Hatcheries will use stable and cost effective programs to provide significant fisheries benefits.*
- *Wild spawner escapement objectives will be provided and met.*
- *Genetic diversity will be conserved.*
- *Wild salmonid stocks will be maintained at levels that naturally sustain ecosystem processes.*

#### **Outcomes**

*Implementation of Hatchery Management Actions will contribute to the following salmon recovery outcomes:*

- *We will have productive and diverse wild salmon populations (A).*
- *We will meet the requirements of the Endangered Species Act/Clean Water Act (B).*
- *Hatchery practices meet wild salmon recovery needs (F).*
- *Enhance compliance with resource protection laws (H).*
- *We will reach out to citizens (I).*

**Hat-1.**

**Action:** Complete comprehensive WDFW hatchery program evaluation, developing recommendations for improvements in hatchery practices that affect native fish populations (such as hatchery fish release locations, size and timing, localized broodstocks, wild fish upstream passage at hatchery traps, hatchery discharge water quality, and disease exchange issues) and ensure ESA compliance, as well as measures that improve hatchery fish survival and promote more efficient use of facilities. (Phase I)

<p><b>Key Tasks</b></p>	<ol style="list-style-type: none"><li>1. In addition to the evaluation of production/supplementation/recovery programs discussed in <b>Hat-2</b>, evaluation of WDFW, (tribal), volunteer cooperative programs and Regional Fisheries Enhancement Group hatchery programs involves detailed descriptions of current hatchery programs and operations and identification of possible conflicts between production programs and ESA recovery requirements and/or the WSP. This review will be accompanied by an economic cost/benefit analysis of production programs with recommendations for increasing efficiency. This economic analysis will be conducted by an outside contractor.</li><li>2. The information on which the evaluation is based is compiled from Future Brood Document (FBD), interviews with complex and hatcheries staff and other Fish Program staff, examination and analysis of recent data on various data bases (e.g. Hatcheries data bases, Regional Mark Information System data base, commercial and sport catch data bases), and current budget and spending information. Additional information included in the review will come from ESA recovery plans, 4(d) rules, Biological Opinions, etc.</li><li>3. Following agency review of draft evaluations, completed evaluations will be sent to regional implementation teams to resolve ESA/WSP conflicts and make efficiency improvements.</li><li>4. Develop Hatchery and Genetic Management plans for each hatchery program to evaluate Hatchery production relating to ESA/WSP.</li></ol>
<p><b>Output - work accomplished</b></p>	<ul style="list-style-type: none"><li>- Draft evaluations (generally a separate document for each WDFW hatchery complex or watershed) distributed for agency review,</li><li>- Final evaluations (sent to regional implementation teams for action),</li><li>- Cost/benefit analyses, and</li><li>- Yearly updates on changes in production programs to meet ESA/WSP requirements and improve efficiency.</li><li>- Hatchery and Genetic Management Plan for each Hatchery program.</li></ul>

<p><b>Time line &amp; Key milestones</b></p>	<p>November 1999 - The final version of the Hood Canal Hatcheries evaluation will be completed (August 99 – A draft evaluation of Hood Canal Complex hatcheries).  July 1, 2001 - The evaluation of all complexes should be completed.  Starting in 1999 - Annual updates on changes to programs and operations in each complex will be documented each year.  March 1, 2000 - Annual report to be completed.  June 30, 2000 - Complete Hatchery and Genetic Management Plan for Puget Sound Chinook and Columbia River Steelhead.</p>
<p><b>Staffing (FTEs) &amp; funding (\$ and sources)</b></p>	<p>3 FTEs (WDFW)  <b>Total:</b> \$450,000  \$350,000 GF-S (WDFW)  \$100,000 GF-F (WDFW)</p>
<p><b>Responsible Agency (ies)</b></p>	<p><b>Coordinated</b> effort, with WDFW and Tribes co-lead. Several agencies are conducting evaluations of hatchery programs in Washington State. This action will dovetail with ongoing efforts being conducted by the USFWS and the NWPPC. It is anticipated that Tribal co-managers may also participate, and include Tribal hatcheries in the review.</p> <p>The Hatcheries Review Unit will need to be aware of ESA recovery requirements developed by both NMFWS and USFWS in order to identify any conflicts between ESA and hatchery production programs. The Hatchery Review Unit gets most of its information regarding recovery requirements from Fish Management staff who are writing take permit applications and communicating with the services on a daily basis. In addition, Hatchery Review staff will communicate directly with NMFS and USFWS to verify recovery requirements affecting hatchery operations.</p> <p>When changes in production programs are proposed by regional implementation teams WDFW regional staff and Hatchery Operations Managers will negotiate these changes with affected Tribes. Agreed-to changes will be made in the Future Brood Document. If changes to production programs affecting Regional Fisheries Enhancement Groups (RFEG) and volunteer co-operative groups are proposed, regional staff will discuss these changes with the groups and make changes to the FBD. NMFS and USFWS have been and are likely to continue to be involved in many of these discussions.</p>

**Hat-2.**

**Action:** Evaluate supplementation and stock recovery production programs relative to wild fish needs, define appropriate stock recovery methods involving supplementation, implement improvements to existing programs as needed, and determine potential for additional programs that could contribute to wild fish recovery; modify or eliminate programs that have a high risk of adversely affecting listed wild fish. (Phase II)

<p><b>Key Tasks</b></p>	<p>This action is a continuation of the comprehensive WDFW hatchery program evaluation <b>Hat-1</b>. It will be integrated with the efforts in Hat-1 and a number of other processes where design and review of hatchery programs that specifically aid listed species will occur. Key tasks:</p> <ol style="list-style-type: none"><li>1. Define specific policy, science, and operational issues that need review/action as envisioned in the Wild Salmonid Policy and define appropriate processes including public involvement.</li><li>2. Define core team(s) of agency staff necessary to complete relevant policy, science and operational reviews and an oversight team to integrate the information into appropriate decision making.</li><li>3. Define appropriate approaches with affected co-managers to participate in review and decision making, recognizing various implementation tracks that may be ongoing due to recovery plan development and related watershed planning.</li></ol> <p>While the specific details of review parameters will be defined by these tasks evaluating whether existing or proposed supplementation programs contain the following essential elements can reasonably be expected:</p> <ul style="list-style-type: none"><li>- clearly defined goals and objectives and description of current and desired resource status/condition,</li><li>- diagnosis of limiting factors and critical uncertainties,</li><li>- recommended restoration strategies, not limited to supplementation, needed for long-term recovery,</li><li>- genetic and ecological risk analysis,</li><li>- formal operational plan and design (e.g., broodstock choice, collection and mating/spawning protocols, and natural escapement management),</li><li>- progress of ongoing evaluations in answering uncertainties, and</li><li>- formal decision framework – specific performance criteria by which to modify or discontinue program.</li></ul>
<p><b>Output-work accomplished</b></p>	<ul style="list-style-type: none"><li>- Updated project lists.</li><li>- Completed project plans and status information.</li><li>- Documented reviews and recommendations.</li><li>- Implementation plans.</li></ul> <p>This is essentially a planning and evaluation task. Performance will be determined initially by whether products are completed by defined time lines. Additionally, the scientific review parameters, approach and outcomes will be peer reviewed while policy assessment and decisions will be open to public participation and review to ensure accountability.</p>

<p><b>Time line &amp; Key milestones</b></p>	<p>2001-03 Biennium - Project review work plans and priorities at which time further time lines and milestones will then be identified. To the extent that these reviews are a necessary element of constructing formal recovery plans under ESA, associated time lines will drive this specific recovery task area.</p>
<p><b>Staffing (FTEs) &amp; funding (\$ and sources)</b></p>	<p>Staffing is included in <b>Hat-1</b> above. There is no staffing dedicated to this project activity in this biennium.</p>
<p><b>Responsible Agency (ies)</b></p>	<p><b>Coordinated</b> effort with WDFW and Tribes co-lead. Some review will occur at a broad multi-tribe/state/federal general level, but is important that local tribal and state staff be heavily involved in this activity since project planning, evaluation and adaptive management occurs at the geographic scale of watershed. Peer review and policy oversight will be integrated to local efforts as a way to ensure consistent accountability, performance and certainty. Significant public interaction is anticipated given the level of locally based, volunteer effort in the salmonid recovery project area.</p>

**Hat-3.**

**Action:** Continue artificial production-related research, including post-release behavior, migration speed, homing and health of hatchery fish, in order to refine practices that reduce ecological interactions with wild fish.

<p><b>Key Tasks</b></p>	<ol style="list-style-type: none"> <li>1. Research related to artificial production is accomplished in two primary forms: 1) Hatchery related efficiency and methods improvement, and 2) Species interactions.</li> <li>2. These activities are integrated into broad multi disciplinary investigations including those described in the "Fish Ecology Research" section of this document. Investigations of this type are entirely funded through federal and local sources as there is no support on state dollars even though a significant portion of hatchery production is state funded.</li> <li>3. Extensive research designed to document fish behavior, species interactions, and migration timing is presently in place at several large-scale mitigation programs. These programs produce or are located adjacent to, fish listed under the ESA and have been pro active to collect vital information required for operation under the authority of the NMFS or USFWS.</li> <li>4. As a research function, Resource Assessment and Development's goal is to develop and maintain meaningful long term monitoring, evaluation, and experimental functions to provide critical scientific information to improve management of the fish resource. To do this, requires a continual quest for funds from a myriad of sources, which pieced together result in a continual funding base on which to work.</li> </ol>
<p><b>Output - work accomplished</b></p>	<p>Annual reports to the funding agencies and when sufficient scientific information is achieved, in agency technical reports and refereed journal articles.</p> <p>Basic information collected by these research projects that are valuable to fish managers for escapement or harvest estimates is made available as it is collected.</p> <p>Use of research results to improve management and the incremental improvement in the issue being investigated (such as reducing species interactions or mass marking techniques).</p>
<p><b>Time line &amp; Key milestones</b></p>	<p>Time lines are project specific and are dictated by the needs of the funding source.</p>
<p><b>Staffing (FTEs) &amp; funding (\$ and source)</b></p>	<p>2 FTEs (WDFW)  <b>Total:</b> \$840,000        \$840,000 GF-F (WDFW)</p>
<p><b>Responsible</b></p>	<p><b>Coordinated</b> effort with WDFW lead. Research and evaluation efforts</p>

<b>Agency(ies)</b>	are cooperative with Tribal and local governments either within staff or through funding. WDFW responsibility is to provide the best credible scientific resource information to the management deliberation process (agency, inter agency, and public) to allow for a solid foundation on which to make resource management decisions.
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**Hat-4.**

**Action:** Continue to mass mark chinook and coho hatchery products so that hatchery fish can be differentiated from wild fish in fisheries and on spawning grounds.

<b>Key Tasks</b>	Coordination and implementation of mass marking project. Tasks include: <ol style="list-style-type: none"><li>1. Tribal negotiations,</li><li>2. Coordinating fish availability,</li><li>3. Trailer moving, staffing, supplying, fish marking, and</li><li>4. Fish sampling.</li></ol>
<b>Output - work accomplished</b>	100+ million chinook, 35+ million coho marked.  100% of the hatchery coho and chinook marked within the allotted budget. The goal is to mark 100% of hatchery coho, and a theoretical goal of 100% of hatchery chinook statewide. As negotiations and agreements with area Tribes define the chinook goal, WDFW will direct its efforts toward its achievement.
<b>Time line &amp; Key milestones</b>	Ongoing - Work that occurs primarily in the Spring and Fall. Chinook mass marking started in 1999 with the 1998 brood fish. Coho started in 1996 with the 1995 brood fish. Statewide marking of coho was first accomplished with the 1996 brood. Key milestones are measured by hatchery and geographical area completed and by percentage of statewide production.
<b>Staffing (FTEs) &amp; funding (\$ and sources)</b>	<b>Total:</b> \$3,060,000 \$1,860,000 GF-S (WDFW) \$ 800,000 GF-F (WDFW) \$ 400,000 GF-P/L (WDFW)  Staff consists of about 175 temporary seasonal workers.
<b>Responsible Agency (ies)</b>	<b>Coordinated</b> effort with WDFW and the Tribes as co-lead. With the Tribes as co-managers, agreement must be reached concerning the marking of all groups of fish. These Tribal negotiations take time and WDFW is working through them. The agency has and continues to assist local Tribes with sampling and marking Tribal fish when requested. WDFW will also coordinate mass marking with the USFWS at the federal USFWS hatcheries producing chinook and coho.

**Hat-5.****Action:** Review artificial production in the Columbia Basin.

<b>Key Tasks</b>	<ol style="list-style-type: none"> <li>1. Evaluate the purposes of all artificial production facilities and programs in the Columbia Basin, applying the principles, policies and statement of purposes contained in the NW Power Planning Council report - <i>Artificial Production Review</i>.</li> <li>2. Applying the recommended policies and standards, take the necessary steps to evaluate and then improve the operation of hatcheries that have an agreed-upon purpose. There is an initial evaluation and long-term evaluation.</li> <li>2. Use existing processes as much as possible to implement reform policies and standards.</li> <li>3. Establish transition fund and opportunities for reprogramming of funding.</li> <li>4. Form an ad hoc oversight team to oversee the implementation of hatchery reform consistent with the recommended policies.</li> <li>5. Assess in five years success in using existing processes to implement reforms.</li> </ol>
<b>Output - work accomplished</b>	<ul style="list-style-type: none"> <li>- An evaluation report on the purposes for each facility.</li> <li>- Workplans for each facility showing progress toward meeting new standards and purposes as determined through sub-basin planning process.</li> <li>- Funding reviews (of the Bonneville Power Administration- BPA direct fish and wildlife program and reimbursable programs) to measure progress.</li> <li>- Development of comprehensive sub-basin planning process.</li> <li>- NW Power Planning Council recommendations to BPA on annual funding.</li> <li>- 5-year program evaluation</li> </ul>
<b>Timeline &amp; Key milestones</b>	<p>December, 2002 - Task 1 (initial evaluation) to be completed (long-term evaluation will be linked to NWPPC Fish &amp; Wildlife Program Year 2000);</p> <p>Task 2 to begin immediately;</p> <p>Task 3 will occur annually;</p> <p>Program evaluation in 5 years.</p>
<b>Staffing (FTEs) &amp; funding (\$ and sources)</b>	<p>0.25 FTE (WDFW)</p> <p><b>Total:</b> \$36,000</p> <p>\$36,000 GF-F (WDFW)</p>
<b>Responsible Agency (ies)</b>	<p><b>Coordinated</b> effort between NWPPC, Columbia Basin Fish and Wildlife Authority, Tribes, and USFWS. WDFW will also be involved.</p>

**Hat-6.****Action:** Implement improved artificial production practices and facilities to protect wildstocks.

<b>Key Tasks</b>	<ol style="list-style-type: none"> <li>1. Identify physical structures and operations at WDFW hatcheries and volunteer cooperative projects that create obstacles to and/or negative interactions with wild salmon.</li> <li>2. Conduct scientific experimentation of hatchery practices identified in federal legislation as they pertain to Puget Sound and coastal hatcheries.</li> <li>3. Work with each volunteer or volunteer group that has been raising salmon to re-negotiate and update their fish rearing contracts. The new contracts will specify any new requirements per species and will include requirements for quality projects. Changes to existing projects are being negotiated between the volunteers, the WDFW Fish Program and the Business Services Program.</li> </ol>
<b>Output - work accomplished</b>	<ul style="list-style-type: none"> <li>- Prioritized list of physical structures at hatcheries (i.e. water intakes, weirs, pollution abatement ponds) needing construction/ improvements to alleviate negative impacts (i.e. lack of upstream / downstream fish passage) and meet standards (i.e water effluent quality, screened intakes)</li> <li>- Studies conducted on NATURE's rearing, feeding regimes, two-year-old steelhead smolt releases etc.</li> <li>- 216 new volunteer co-op project contracts with appropriate requirements to meet WDFW goals for salmon recovery.</li> </ul>
<b>Timeline &amp; Key milestones</b>	<p>January 2000-July 2000 - Negotiate volunteer co-op contracts  August 2000-December 2000 - Implement and monitor co-op contracts;  October 2000 - Prioritized list of WDFW structure needs  January 2000 - Studies at WDFW and co-op facilities designed and started  Jan. 2001-June 2001 - Enter data into automated system that will contribute data to the Future Brood Document.</p>
<b>Staffing (FTEs) &amp; funding (\$ and sources)</b>	<p><b>Total:</b> \$1,795,000  \$588,000 GF-S (WDFW)  \$500,000 SRA (WDFW)  \$675,000 GF-F (WDFW)  \$ 32,000 Other - ALEA (WDFW)</p>
<b>Responsible Agency (ies)</b>	<p><b>Coordinated</b> effort with WDFW and Tribes as co-lead. In some cases, WDFW also coordinates with DNR, ECY, CC, WDA, if the volunteer project is being affected by land uses or non-point source pollution that is under the purview of other state agencies.</p>

**Hat-7.****Action:** Support Hatchery Scientific Review Group.

<b>Key Tasks</b>	Designate agency scientist to work as member of Hatchery Scientific Review Group (HSRG) established by Congress to ensure that hatchery reform programs in Puget Sound and the Washington coast be scientifically founded and evaluated. HSRG will provide direction and operational guidelines and the system as a whole will be audited for effectiveness based on measurable performance criteria.
<b>Output - work accomplished</b>	<ul style="list-style-type: none"><li>- Develop scientific framework for implementing hatchery reform.</li><li>- Determine if hatcheries are achieving the purposes (benefits) while minimizing any serious adverse effects (risks).</li></ul>
<b>Timeline &amp; Key milestones</b>	June 2000 - Scientific framework developed. June 2000 - Report to Congress on progress. October 2000 - Funding initiative submitted and approved by Congress for future funding. February 2001 - Hatchery system audited. May 2001 - Hatchery Risk Assessment completed.
<b>Staffing (FTEs) &amp; funding (\$ and sources)</b>	2 FTE (WDFW) <b>Total:</b> \$400,000 \$400,000 GF-F (WDFW)
<b>Responsible Agency (ies)</b>	<b>Coordinated</b> effort with WDFW and Tribes as co-lead.

**Hat-8.****Action:** Hatchery Production programs to comply with ESA

<b>Key Tasks</b>	<p>Develop and maintain Captive Brood programs that preserve the genetics of threatened and endangered salmon species in various watersheds throughout the state; supplement depressed stocks and assist recovery of wildstocks using hatchery reared fish.</p> <p>Activities include fish health and facility maintenance support to achieve production goals. These activities occur at the following facilities:  Kendall Creek Hatchery – Nooksack River Spring Chinook; Minter Creek and Hupp Springs Hatcheries – White River Spring Chinook; Elwha Rearing Channel – Elwha Fall Chinook; Dungeness Hatchery – Dungeness Pink, Snow Creek Coho, Chimacum and Salmon Creek Chum; Marblemount Hatchery – Skagit River Chinook; Issaquah Hatchery – Lake Washington Winter Steelhead.</p>												
<b>Output - work accomplished</b>	<p>Annual production of the following numbers of salmon species:</p> <table border="0"> <tr> <td>Spring Chinook</td> <td>2,590,750</td> </tr> <tr> <td>Fall Chinook</td> <td>4,661,560</td> </tr> <tr> <td>Pink</td> <td>31,330 (every other year)</td> </tr> <tr> <td>Coho</td> <td>7,770</td> </tr> <tr> <td>Chum</td> <td>130,000</td> </tr> <tr> <td>Steelhead</td> <td>20,760</td> </tr> </table>	Spring Chinook	2,590,750	Fall Chinook	4,661,560	Pink	31,330 (every other year)	Coho	7,770	Chum	130,000	Steelhead	20,760
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<b>Timeline &amp; Key milestones</b>	<p>Ongoing, until salmon stocks and their habitats are fully recovered. Habitat recovery in streams of origin is a separate activity and is critical to long-term recovery of these salmon stocks.</p>												
<b>Staffing (FTEs) &amp; funding (\$ and sources)</b>	<p>19.6 FTEs (WDFW)  <b>Total:</b> \$2,711,525  \$1,951,000 GF-S (WDFW)  \$ 560,525 Other - ALEA (WDFW)  \$ 200,000 Wildlife Fund – State (WDFW)</p>												
<b>Responsible Agency (ies)</b>	<p>In consultation with NMFS, WDFW establishes a level of risk associated with the long-term survival of listed stocks. Stocks at greatest risk receive the most urgent attention for a Captive Brood program. In consultation with the Tribes, WDFW establishes population goals for specific salmon stocks. Utilizing their own hatchery production, and in some areas providing financial assistance, Tribes assist in the recovery efforts listed above. GSRO is consulted to ensure these activities are in compliance with the Statewide Strategy to Recover Salmon.</p>												